Registration of 'N8001' Soybean

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Soybean [*Glycine max* (L.) Merr.] cultivar N8001 (Reg. No. CV-496, PI 647086) was cooperatively developed and released by the USDA-Agricultural Research Service and the North Carolina Agricultural Research Service (10 Jan. 2007). It is a determinate group VIII maturity soybean cultivar that has excellent yield potential. Twenty-five percent of its parentage is exotic germplasm. Few soybean cultivars produced in the United States have this level of genetic diversity; thus, its release broadens the genetic base of soybean cultivars. N8001 is adapted to the southern United States (30° to 35° N latitude) or wherever cultivars of group VIII maturity are produced.

N8001 is an F_4-derived selection from the cross of USDA cultivar N7001 and 'Cook' (Carter et al., 2003; Boerma et al., 1992). N7001 was derived by crossing USDA breeding line N77-114 to a landrace from Japan, PI 416937 (National Genetic Resources Program, 2007). The PI 416937 appears distinctly different from the previous ancestors of North American soybean in that it has much larger leaves and a more prolific rooting system (Pantalone et al., 1996a,b). N7001 was the first public cultivar released in the United States with this plant introduction in its pedigree. Cook was derived from the cross of cultivars Braxton and Young (Bernard et al., 1988; Burton et al., 1987). The F_1 seeds from the cross of N7001 × Cook were produced in 1994 at Clayton, NC, and F_1 plants were grown during the following winter at the USDA-ARS Tropical Agriculture Research Station (TARS), Isabela, PR. The F_2 and F_3 generations were advanced using the single seed descent breeding method (Brim, 1966). The F_2 generation was advanced at Clayton, NC, in 1995, followed by the F_3 generation at TARS during the winter.

In 1996 individual F_4 plants were grown and harvested at Jackson Springs, NC. Approximately 173 F_4 plants were grown in progeny rows at Clayton, NC, in 1997. Approximately 100 of these progeny rows were entered into replicated yield trials in North Carolina during 1998. The bulked harvest of progeny row N97-9612 was designated as N8001. N8001 is a full sib of USDA maturity group VII cultivar N7002 (Carter et al., 2007).

From 2002 to 2005, N8001 was evaluated in 14 environments of the North Carolina State University Official Variety Trials (Bowman, 2005). N8001 matured one day earlier than Cook, a cultivar adapted to North Carolina. The plant height of N8001 (102 cm) was very similar to that of Cook (101 cm). Plant lodging was rated using a scale of 1 to 5, where 1 is no lodging and 5 is completely lodged at maturity. The plant lodging rating of N8001 (1.6) was similar to Cook (1.9). Yield of N8001 (2949 kg ha^{-1}) was 183 kg ha^{-1} greater than Cook (2766 kg ha^{-1}).

N8001 was evaluated in 48 environments in the USDA-ARS Southern Region Uniform Group VIII Test during 2000 to 2005 (Paris and Shelton, 2006). The maturity of N8001 was similar to that of Cook, the standard control cultivar for the USDA-ARS Southern Region Uniform Group VIII Test. The plant height of N8001 was equal to Cook (89 cm). N8001 lodged similarly to Cook (score 2.1 to 2.0, respectively). Yield of N8001 (2999 kg ha^{-1}) was 217 kg ha^{-1} greater than Cook (2782 kg ha^{-1}). The 100-seed weight of N8001 (14.8 g) was similar to that of Cook (15.2 g). Seed protein content of N8001 (410 g kg^{-1}) was lower than that of Cook (418 g kg^{-1}), on a zero moisture basis. N8001 had less seed oil content (190 g kg^{-1}) than Cook (193 g kg^{-1}).

N8001 has purple flowers, gray pubescence, tan pod wall color at maturity, and shiny yellow seeds with imperfect black hila. In USDA regional tests, N8001 was rated resistant to soybean mosaic virus and stem canker [caused by *Diaporthe phaseolorum* (Cooke and Ellis) Sacc. var. meridionales F.A. Fernandez]. It was rated susceptible to soybean cyst (*Heterodera glycines* Ichinohe) and root-knot nematodes [*Meloidogyne arenaria* (Neal) Chitwood and *Meloidogyne incognita* (Kofoid & White) Chitwood]. In USDA field trials in North Carolina, N8001 was rated resistant to bacterial pustule (*Xanthomonas axonopodia* pv. *glycines*), and frogeye leaf spot (*Cercospora sojina* K. Hara). N8001 also resisted pod shattering after maturity, even with extensively delayed harvest, based on field observations in North Carolina.

Small seed quantities of N8001 will be available for research purposes from the corresponding author. It is requested that appropriate recognition be made if N8001 contributes to the development of a new germplasm line or cultivar. Seed will also be deposited in the National Center for Genetic Resources Preservation and National Plant Germplasm System.

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